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Role of Codeposited Impurities in Growth: Dependence of Morphology on Binding and Barrier Energies[1] RAJESH SATHIYANARAYANAN, Univ. of Maryland, College Park & Pennsylvania State Univ., University Park, A. BH. HAMOUDA, UMD & Univ. of Monastir, Tunisia, A. PIMPINELLI, UMD & Science Attaché, French Embassy, Houston, T. L. EINSTEIN, UMD — The previous talk showed that codeposition of impurity atoms during epitaxial growth could be used for nanostructuring of surfaces. Based on their lateral nearest-neighbor binding energies (E_{NN}) to Cu and their diffusion barriers (E_d) on Cu(001), we classify the candidate impurity atoms into four sets. We find that codeposition of impurities from different sets produce qualitatively different surface morphologies both in the step-flow and the submonolayer ($\theta \leq 0.7$ ML) regimes. In the submonolayer regime, we characterize these differences through variations of the number of islands (N_i) and the average island size with coverage (θ). Further, we compute the critical nucleus size (i) for all of these cases from the distribution of capture-zone areas using the generalized Wigner distribution.[2]

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[2]A. Pimpinelli, T. L. Einstein, Phys. Rev. Lett. 99, 226102 (2007).

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